DOCUMENT RESUME

ED 332 199 CS 212 825

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TITLE WAC and Engineering, or Why Engineers Can't Write.
PUB DATE 21 Mar 91
NOTE 9p.; Paper presented at the Annual Meeting of the Conference on College Composition and Communication (42nd, Boston, MA, March 21-23, 1991).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *College Faculty; Faculty Development; Higher Education; Inservice Teacher Education; Program Effectiveness; Seminars; *Teacher Attitudes; *Writing Across the Curriculum; Writing Attitudes
IDENTIFIERS State University of NY of Tech at Farmingdale

ABSTRACT

In response to criticisms from an accrediting agency, the director of the Writing across the Curriculum (WAC) program at the State University of New York, Farmingdale, designed a one-day marathon session and a series of biweekly seminars to bridge the gap between WAC truths and the assumptions of the engineering faculty concerning writing processes and writing to learn. At first, the engineers blamed the English department for their students' inability to write acceptable laboratory reports. After a lively debate in one session which began with the realization that students did not know what was expected of them in the lab report, the engineers realized that they could not even agree among themselves about the objectives of a lab report. They realized that the problem was not that the English department had failed, but that they were not able to articulate for their students what a lab report should be. The second semester saw the addition to the program of faculty in physics and chemistry and a revival of the earlier discussions about the failure of the English department by the new participants. Responses to the WAC program are encouraging: participants speak of the impact of the program on pedagogy, critical thinking and cross-curriculum thinking, writing as a learning tool, and interdisciplinary responsibility. While the requirements of the accrediting agency and administrative support were crucial in getting started, what has sustained the program is that the faculty began to see improvement in student learning. (RS)

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ED332199

WAC and Engineering, or Why Engineers Can't Write

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Paper Delivered at the CCCC Annual Convention
March 21, 1991

The title of my talk, "WAC and Engineering or Why Engineers Can't Write," seems much less appropriate today than when I wrote it last fall. By now most of the engineering professors who have been in the WAC program at SUNY, Farmingdale since its inception in 1989 have in some sense become teachers of writing.

My story begins when,as Director of Writing Across the Curriculum, I was asked by the Dean of the School of Engineering Technologies to work with his faculty because of an ABET (American Board of Engineering Technolgies) report, which faulted the engineering faculty for insufficient attention to student writing. (ABET accredits our engineering programs, and therefore, ABET criticism is taken very seriously.)

In order to bridge the gap between WAC truths and engineers' assumptions, I brought in a consultant for a one-day marathon session and then organized biweekly seminars. Despite an enthusiastic group and a supportive dean, who was coming to most of the meetings, the problem proved to be more complicated than anticipated.

Indeed, the first and most important task was nothing more than defining precisely what the **problem** was. The ABET team specifically had noted that in one engineering curriculum (Biomedical Engineering Technology) "student's writing was not corrected for grammar and English, e.g. misspelled medical

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terms." It suggested that "the written student homework should be corrected and graded with communication skills taken into account." Another curriculum was advised "that writing be incorporated by requiring written laboratory reports, research reports, etc." And a third curriculum was criticized because "a sound program of technical writing within the program has not been implemented."

As teachers of writing, we could, no doubt, critique the criticism, but the ABET comments were crucial in calling attention to the importance of writing in engineering--an achievement that the combined efforts of the 4 C's membership probably could not have accomplished. Impetus for interdisciplinary writing programs, it seems to me, must come from a perceived need within individual disciplines.

Nonetheless, initially, the engineers translated ABET criticism to mean that the English Department had fallen down on the job. It was obvious to engineering faculty members trained to think of learning as sequential that the English Department should teach grammar and spelling to incoming freshmen so that thereafter students could write decent lab reports and research papers, while the engineering faculty, for its part, could concentrate on engineering.

I, on the other hand, had ideas about writing to learn and the writing process and tried to get the engineers to understand that spelling and grammar could be approached only <u>after</u> students had put their thoughts into writing. But the engineers argued that they had a curriculum to cover, and it would simply take too

much time to give students increased opportunities to write and revise. If such opportunities were in fact needed, some suggested that we should eliminate Egl. 102, Composition: Literature and replace it with what they callled a "useful" course in technical writing.

Although I could not agree with their solution for easing their burden, I thought that their complaints were legitimate and tried to help by offering them peer tutors whom I had trained. But when they learned that peer tutors would relate to content more than spelling and mechanics, some lost interest because they thought that content was their business and peer tutors did not have expertise in their areas.

It was no use trying to explain; they would have to be shown. I realized I would have to construct a kind of mini-course for faculty using the text most familiar to them, i.e. the lab report.

After much discussion, it was agreed that students typically produced inadequate poorly written conclusions in their lab reports, even when the mathematics was accurate and the graphs correctly drawn. I asked to see some samples of poorly written conclusions, and it won't surpise anyone here, that students had no idea what they were supposed to conclude. Sometimes their ingenuousness was touching. One student, for example, wrote as his conclusion "I found this lab really very enjoyable." Others babbled about the difference between the theoretical and the experimental but seemed to have little understanding of what those terms meant or how they related to a specific experiment.

We decided that our immediate agenda would be to discuss writing conclusions, but it soon became apparent that we could not discuss conclusions unless we discussed objectives. The meeting that ensued turned out to be the liveliest and most interesting meeting of the year. Senior engineering faculty who had been designing, assigning, and grading lab reports for their entire careers could not agree on the objective of a lab report.

What they finally discovered was that the enemy was not dumb students or a recalcitrant English Department that refused to teach spelling and mechanics; the enemy they met was themselves. Since the problem was theirs, they would need to solve it.

Here was a group of professionals on the line, trying to defend their own assumptions and finding themselves stuck. Help came from an outsider. During the semester our group had been joined by a retired engineer with degrees in both engineering and Englisn, who thought it would be fun to participate. He managed to get the group through the impasse when he suggested that laboratory experiments are devised in order for people to do something. He suggested, "Find the verb that expresses the action, mental or physical, that describes what you want to do, and you will have defined the objective of a lab experiment." It seemed simple enough.

One professor volunteered to be the scribe, and for the next several minutes he wrote furiously on the board as participants suggested verbs. The list grew so that it covered the entire front wall of the room. But meanings overlapped, and consensus could not be reached. We moved on to try to write a sample

statement of an objective that might provide a common basis for all lab reports. An hour later, after rejecting a number of complex statements, the engineers came up with a single sentence: "The objective of a lab experiment is to verify the theoretical_____through_____experimentation, as in the following sample statement: "To verify the theoretical constant,, K, through static and dynamic experimentation."

To be sure, we had not discovered the fourth dimension or the laws of infinity, but the excitement was palpable as 15 or so professional engineers finally agreed that the purpose of a lab was to verify something. We then decided that a conclusion would obviously indicate that a theory was or was not verified. In fact, what we were finally talking about was thinking.

A few days later after the minutes of the meeting had been distributed, I bumped into the Vice President of Academic Affairs rushing between buildings. She stopped long enough to exclaim, "I don't believe it--engineers talking about verbs."

By the time the semester ended a few of the participants decided that in the fall we ought to invite representatives from the other science departments to work with the engineers since they all taught lab reports and presumably had common goals. Therefore, in the fall of 1990 WAC became WIST (Writing in Science and Technology). What I had once thought of as a short-term program was going to take more time. I worried whether people would continue to come. Participants received neither honorariums nor released time. In 1989 we had provided lunch; now, with the overwhelming New York State deficit looming over everything, the College could no longer provide anything.

I announced the first meeting of the fall semester with some trepidation, but the orignal group appeared along with representatives from the Physics and Chemistry Departments. Before long, however, new difficulties emerged. What seeemed clear to the original participants was by no means clear to the newcomers, and some of the original participants were beginning to have doubts anyway. After all, what we were doing was insisting that they, not necessarily the English Department or the students, make changes.

It became evident that faculty are not very different from students in the way that they assimilate information. The learning path is not straight but circular. Ideas must be restated, reinforced, modified, and redeveloped. Furthermore, if we were going to succeed, ideas now accepted in many classes in the engineering technologies and some science classes would have to be supported throughout the college. While the engineering and science professors no longer expected the English Department alone to assume the task of teaching writing, they wanted to be sure that the English Department was laying the foundation for the writing that would take place in engineering classes.

To accomplish the goal of a college-wide writing program, I applied to a joint-labor management committee for a grant, which has recently been awarded. While the details of the grant and the enlarged project need not concern us here today, one requirement of the granting agency was an evaluation, the results of which I would like to share with you. Until I was asked to do a formal assessment, I had been satisfied that even though there

were no tangible incentives, participants kept coming. Now we needed to ascertain precisely what people thought they had learned.

The responses were very encouraging. They wrote about new pedagogy, critical thinking and cross-curriculum thinking, writing as a learning tool, and interdisciplinary responsibility. And most important, they talked about some of their own innovations. One person said the seminars "enabled me to take a crtical view of the lab manual I am presently writing." Another commented that the seminars "encouraged me to examine the purposes of assignments." Several talked about specific changes in pedagogy; for example, "I have students evaluate other students´ presentations, encourage students to work in small study groups and to write down questions before coming to class." The Dean summed up, "Good grammar and good spelling alone are not enough to convey ideas clearly....Laboratory reports should be used as an exercise of the student´s ability to write clearly and logically, and this requirement can give the students a better understanding of the technical content....Every single technical course should have at least one written assignment; if the students don´t continually use what they learned in Freshman Composition, they will lose it." The combined comments were persuasive evidence that we had come a very long way since the original ABET critique.

And yet because of ABET, we had stumbled on a format, which is probably not typical of other WAC programs, namely disicpline-specific school seminars, which made use of a familiar text, in

this case, the lab report. Some of the engineers are now talking about journals and microthemes, but the lab report has provided the means to open the discussion about writing. In a sense we were able to implement John Dewey's basic premise that we must meet the students where they are--even when the students are our own experienced teaching faculty.

In trying to encapsulate the reasons for the success of our program so far, I would suggest that both the requirements of the accrediting agency and administrative support were crucial in getting started. But I believe that what has sustained the program is that the faculty began to see improvement in student learning. While studies show that most faculty agree on the importance of teaching, particularly at institutions like ours, which is not research oriented, there is generally little opportunity for faculty to work with colleagues on what we all do, i.e. teach. Our seminars work because they fill a very real need.